

SYNOPSIS OF THE MOSSES OF WYOMING

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ABSTRACT.—A revised list of the mosses of the State of Wyoming is presented. Recorded are 315 species and varieties.

Key words: bryophytes, Wyoming, Porter, Rocky Mountains, checklist, flora.

Publication of the mosses of Wyoming began with Aven Nelson (1900) listing 119 species. His collections were made essentially in the Laramie and Medicine Bow ranges of Carbon and Albany counties, and his specimens are now at the Rocky Mountain Herbarium (RM). Nelson's specimens were determined in large part by Professor John M. Holzinger, of the State Normal School at Winona, Minnesota. Aven Nelson's and Elias Nelson's Wyoming collections were distributed under printed labels as "Plants of Wyoming from the Rocky Mountain Herbarium" and "Plants of Yellowstone National Park from the Rocky Mountain Herbarium," citing Holzinger and a few others as determiners. However, because they were issued without serial numbers, showing only the collectors' numbers together with other data, they do not constitute true exsiccatae (Sayre 1971).

In 1935 Cedric Lambert Porter published a valuable checklist of the mosses of the State of Wyoming, citing 215 species and varieties. In this publication Porter mentioned a paper by Dwight C. Smiley on the mosses of Yellowstone National Park, which Porter cited again two years later as "A Key to the Mosses of Yellowstone National Park" [unpublished] (Porter 1937). Porter included Smiley's names but apparently did not examine his specimens.

The substance of a dissertation written by Porter at the University of Washington in 1937 was the development of a useful key to the hepatic and bryophyte taxa of Wyoming. It includes additional county records, a few additional species, and references to Yellowstone National Park, again apparently citing Smiley's unpublished material. On a recent visit to the Yellowstone National Park Herbarium (YELLO),

I was able to locate and borrow for study some of Mr. Smiley's specimens. Several were determined by R. S. Williams.

No checklist focusing on the moss flora of Yellowstone National Park has as yet been published. The 357 or so moss specimens curated at YELLO all derive from the park. The following are collectors and dates of collecting activity: Dwight Smiley, 1932; H. S. Conard, 1948; Winona Welch, 1951; Eula Whitehouse, 1951; Elva Lawton, 1953. No biographical data exist on Mr. Smiley at YELLO (Whipple personal communication). I have no other record that these collectors worked in Wyoming, but my use of various herbaria for this checklist is not exhaustive. Incidentally, there are 11 packets of liverworts at YELLO, and no representation of *Sphagnum*.

Recent collectors in the state include the late Fredrick Hermann, Holmes Rolston, and William Weber, all of whose Wyoming specimens are distributed in various herbaria, especially COLO. Steven Churchill (1979, 1982), John Spence (1985), and Alvin L. Medina (1994) collected additional taxa. Two taxa listed here as new to the state were recently collected by Joseph Elliott (*Scorpidium scorpioides* and *Cinclidium stygium*). General references to extensive collections made in the state are given by Lawton (1971).

The purpose of this paper is to present an up-to-date list of the mosses of the State of Wyoming, incorporating reports published since Porter's manuscripts as well as additional unpublished information. There are 315 species and varieties in the present list. Some idea of the degree of representation of the flora of Wyoming comprising this list may be inferred from a glance at similar checklists for other

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areas. It is probably to be expected that the arid intermountain states, such as Utah and Nevada, will have a more depauperate flora; Spence (1988) recorded 342 species for the entire Intermountain West. The following counts are for species and varieties (except Utah which is species only): Arizona 381 (Johnsen, no date), Colorado 292 (Weber 1973), Idaho 257 (McCleary and Green 1971), Montana 358 (Eversman and Sharp 1980), Nevada 165 (Lawton 1958, Lavin 1981), Oregon 441 (Christy et al. 1982), Utah 256 (Flowers 1973). There appears to be no checklist for the state of Washington. New York State, which is said to have a diverse moss flora, has 503 species and varieties (Ketchledge 1980). A striking comparison is to the oceanic island of Newfoundland, which boasts a moss flora of 445 species (Brassard 1983) and which is geophysically rather plain compared to the geomorphic extremes and diversity of Wyoming in the Central Rocky Mountains.

The following checklist is based largely on a review of specimens housed in the Rocky Mountain Herbarium. Additional herbaria were contacted in instances of taxa reported in the literature but with no representation at RM, and numerous new records have been added from field collections by myself and others. I have attempted to cite at least one reliable specimen of each taxon by giving the abbreviation of the herbarium at which the specimen is located. Additional taxa are added from Porter's 1937 dissertation if they did not occur in his previous publication. If a herbarium designation is noted below for a taxon, no further reference to the literature is given. Although several references to the same species throughout the literature may have been cited, only one citation is presented for names for which specimens have not been seen.

Nomenclature other than *Sphagnum* follows Anderson et al. (1990). *Sphagnum* nomenclature follows Anderson (1990).

Families are given alphabetically, genera alphabetically within families, and species alphabetically within genera.

CHECKLIST OF MOSSES OF WYOMING

AMBLYSTEGIACEAE

- Amblystegium serpens* (Hedw.) Schimp. var. *serpens* (NY, RM)
 var. *juratzkanum* (Schimp.) Rau & Herv. (RM)
Amblystegium varium (Hedw.) Lindb. (NY, RM)

- Calliergon cordifolium* (Hedw.) Kindb. (TENN)
Calliergon giganteum (Schimp.) Kindb. (NY)
Calliergon richardsonii (Mitt.) Kindb. in Warnst. (Lawton 1971)
Calliergon stramineum (Brid.) Kindb. (COLO, RM)
Calliergon trifarium (Web. & Mohr) Kindb. (Cooper and Andrus 1994)
Calliergonella cuspidata (Hedw.) Loeske (WTU)
Campyllum chrysophyllum (Brid.) J. Lange (BUF, RM)
Campyllum hispidulum (Brid.) Mitt. (NY)
Campyllum polygamum (Schimp. in BSG) C. Jens. (RM)
Campyllum stellatum (Hedw.) C. Jens. (RM)
Conardia compacta (C. Muell.) Robins. (NY, WTU)
Cratoneuron filicinum (Hedw.) Spruce (NY, RM)
Drepanocladus aduncus (Hedw.) Warnst. var. *aduncus* (RM)
 var. *kneiffii* (Schimp. in BSG) Moenk. (RM)
 var. *polycarpus* (Bland. ex Voit) Roth (COLO, RM)
Drepanocladus capillifolius (Warnst.) Warnst. (RM)
Drepanocladus crassicosatus Janssens (CANM)
Drepanocladus scudtneri (Schimp.) Warnst. (BING)
Hygroamblystegium noterophilum (Sull. & Lesq. in Sull.) Warnst. (RM)
Hygroamblystegium tenax (Hedw.) Jemm. (RM)
Hygrohypnum bestii (Ren. & Bryhn in Ren.) Broth. (WTU)
Hygrohypnum duriusculum (De Not.) Jamieson (CSU)
Hygrohypnum luridum (Hedw.) Jemm. (NY, RM)
Hygrohypnum molle (Hedw.) Loeske (RM, WTU)
Hygrohypnum ochraceum (Turn. ex Wils.) Loeske (BUF, CSU, RM)
Hygrohypnum smithii (Sw. in Lilj.) Broth. (RM)
Leptodietyum humile (P. Beauv.) Ochyra (RM)
Leptodietyum riparium (Hedw.) Warnst. (NY, RM)
Limprichtia revolvens (Sw.) Loeske (BING, BUF)
Palustriella commutata (Brid.) Ochyra (RM, WTU)
Palustriella decipiens (De Not.) Ochyra (RM, WTU)
Pseudocalliergon turgescens (T. Jens.) Loeske (COLO, RM)
Sanionia uncinata (Hedw.) Loeske (NY, RM)
Sarmenthyllum sarmentosum (Wahlenb.) Tuom. & T. Kop. (BING, COLO, RM)
Scorpidium scorpioides (Hedw.) Limpr. (BUF)
Warnstorfia exannulata (Schimp. in BSG) Loeske
 var. *exannulata* (CSU, RM)
Warnstorfia fluitans (Hedw.) Loeske (COLO, RM)

ANDREAEACEAE

- Andreaea rupestris* Hedw. (YELLOW)

AULACOMNIACEAE

- Aulacomnium androgynum* (Hedw.) Schwaegr. (TENN)
Aulacomnium palustre (Hedw.) Schwaegr. (BUF, RM, TENN)

BARTRAMIACEAE

- Anacolia menziesii* (Turn.) Par. (WTU)
Bartramia ithyphylla Brid. (RM)
Philonotis fontana (Hedw.) Brid. var. *fontana* (BUF, RM)
 var. *americana* (Dism.) Flow. (BUF, RM)
 var. *caespitosa* (Jur.) Schimp. (BUF, RM)
 var. *pumila* (Turn.) Brid. (RM)

BRACHYTHECIACEAE

- Brachythecium acutum* (Mitt.) Sull. (RM)
Brachythecium albicans (Hedw.) Schimp. in BSG (RM)

- Brachythecium collinum* (Schleich. ex C. Muell.) Schimp. in BSG (BUF, RM, US)
Brachythecium erythrorhizon Schimp. in BSG (RM)
Brachythecium fendleri (Sull.) Jaeg. (RM)
Brachythecium frigidum (C. Muell.) Besch. (NY, US)
Brachythecium leucogii Grout (NY, RM, US)
Brachythecium nelsonii Grout (CSU, NY, RM)
Brachythecium oedipodium (Mitt.) Jaeg. (COLO, RM, US)
Brachythecium rivulare Schimp. in BSG (NY, RM, US)
Brachythecium rutabulum (Hedw.) Schimp. in BSG (NY)
Brachythecium salebrosum (Web. & Mohr) Schimp. in BSG (BUF, RM, US)
Brachythecium starkei (Brid.) Schimp. in BSG (Porter 1935)
Brachythecium turgidum (C.J. Hartm.) Kindb. (COLO, NY, RM, US)
Brachythecium velutinum (Hedw.) Schimp. in BSG
 var. *velutinum* (Spence 1985)
 var. *venustum* (De Not.) Are. (BUF, RM)
Cirriphyllum cirrosum (Schwaegr. in Schultes) Grout (NY)
Eurhynchium oreganum (Sull.) Jaeg. (Spence 1985)
Eurhynchium pulchellum (Hedw.) Jenn. (RM)
Homalothecium aeneum (Mitt.) Lawt. (RM, US)
Homalothecium nevadense (Lesq.) Ren. & Card. (US)
Homalothecium pinnatifidum (Sull. & Lesq.) Lawt. (BUF, RM)
Tomentypnum nitens (Hedw.) Loeske (COLO, RM)

BRYACEAE

- Bryum algovicium* Sendtn. ex C. Muell. (BUF, RM, US)
Bryum alpinum Huds. ex With. (Porter 1935)
Bryum amblyodon C. Muell. (Spence 1985)
Bryum arcticum (R. Br.) Bruch & Schimp. in BSG (Lawton 1971)
Bryum argenteum Hedw. (RM)
Bryum caespiticium Hedw. (RM, US)
Bryum capillare Hedw. (RM, US)
Bryum cyclophyllum (Schwaegr.) Bruch & Schimp. in BSG (RM, WTU)
Bryum dichotomum Hedw. (Spence 1985)
Bryum lisae De Not. var. *cuspidatum* (Bruch & Schimp. in BSG) Marg. (RM)
Bryum pallescens Schleich. ex Schwaegr. (RM)
Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer & Scherb. (RM)
Bryum turbinatum (Hedw.) Turn. (NY, RM)
Bryum uliginosum (Brid.) Bruch & Schimp. in BSG (Spence 1985)
Bryum weigeli Spreng. in Biehler (RM)
Leptobryum pyriforme (Hedw.) Wils. (RM)
Pohlia andalusica (Hoehn.) Broth. (Shaw 1981)
Pohlia bolanderi (Sull.) Broth. var. *seriata* Shaw (CSU, RM)
Pohlia camptotrachela (Ren. & Card.) Broth. (Shaw 1981)
Pohlia cruda (Hedw.) Lindb. (BUF, RM)
Pohlia drummondii (C. Muell.) Andr. (WTU)
Pohlia elongata Hedw. (Porter 1935)
Pohlia lescuriana (Sull.) Grout (Porter 1935)
Pohlia longicolla (Hedw.) Lindb. (RM)
Pohlia ludwigii (Schwaegr. ex Schwaegr.) Broth. (RM)
Pohlia nutans (Hedw.) Lindb. (BUF, CSU, RM)
Pohlia obtusifolia (Brid.) L. Koch. (COLO, RM)
Pohlia prolifera (Kindb. ex Brid.) Lindb. ex Arnell (BUF)
Pohlia tundrae Shaw (BUF, RM)
Pohlia wahlenbergii (Web. & Mohr) Andrews (RM)
Roellia roellii (Broth. in Roell.) Andrews ex Crum (RM, WTU)

BUXBAUMIACEAE

- Buxbaumia aphylla* Hedw. (WTU)
Buxbaumia viridis (DC.) Mouq. & Nestl. (WTU)

CLIMACIACEAE

- Climacium americanum* Brid. (BING, BUF)
Climacium dendroides (Hedw.) Web. & Mohr (COLO, CSU, RM)
Climacium kindbergii (Ren. & Card.) Grout (Porter 1935)

DICRANACEAE

- Campylopus fragilis* (Brid.) Bruch & Schimp. in BSG (WTU)
Cynodontium alpestre (Wahlenb.) Milde (Lawton 1971)
Cynodontium polycarpon (Hedw.) Schimp. (Porter 1935)
Cynodontium schisti (Web. & Mohr) Lindb. (Porter 1935)
Dichodontium olympicum Ren. & Card. (RM)
Dichodontium pellucidum (Hedw.) Schimp. (RM)
Dicranella schreberiana (Hedw.) Hilf. ex Crum & Anderson (RM)
Dicranella subulata (Hedw.) Schimp. (RM)
Dicranoweisia cirrata (Hedw.) Lindb. ex Milde (RM)
Dicranoweisia crispula (Hedw.) Lindb. ex Milde (COLO, RM)
Dicranum bonjeanii De Not. in Lisa (Porter 1937)
Dicranum muehlenbeckii Bruch & Schimp. in BSG (COLO, RM)
Dicranum polysetum Sw. (Wynne 1943, Ireland 1982)
Dicranum rhabdocarpum Sull. (RM)
Dicranum scoparium Hedw. (RM)
Dicranum spadiceum Zett. (COLO, RM)
Dicranum tauricum Sapehin (RM)
Oncophorus virens (Hedw.) Brid. (RM)
Oncophorus wahlenbergii Brid. (COLO, RM)
Paraleucobryum enerve (Thed. in Hartm.) Loeske (COLO, RM)

DITRICHACEAE

- Ceratodon purpureus* (Hedw.) Brid. (BUF, RM)
Distichum capillaceum (Hedw.) Bruch & Schimp. in BSG (BUF, RM)
Distichum inclinatum (Hedw.) Bruch & Schimp. in BSG (NY, RM)
Ditrichum flexicaule (Schwaegr.) Hamp. (RM)
Saelania glaucescens (Hedw.) Broth. in Bomanss. & Broth. (WTU)

ENCALYPTACEAE

- Encalypta alpina* Sm. (Porter 1937)
Encalypta ciliata Hedw. (Porter 1937, Horton 1983)
Encalypta proccra Bruch (Porter 1937)
Encalypta rhabdocarpa Schwaegr. (RM)
Encalypta vulgaris Hedw. (RM)

FISSIDENTACEAE

- Fissidens adianthoides* Hedw. (WTU)
Fissidens bryoides Hedw. (RM, WTU)
Fissidens grandifrons Brid. (BUF, RM, WTU)
Fissidens obtusifolius Wils. var. *marginatus* Flow. (NY)
Fissidens osmundioides Hedw. (WTU)

FONTINALACEAE

- Dichelyma falcatum* (Hedw.) Myr. (COLO, RM)
Dichelyma uncinatum Mitt. (WTU)
Fontinalis antipyretica Hedw. var. *antipyretica* (RM, WTU)
 var. *gigantea* (Sull.) Sull. (RM)
 var. *oregonensis* Ren. & Card. (RM, WTU)
Fontinalis hypnoides Hartm. var. *hypnoides* (RM)
 var. *durivici* (Schimp.) Husn. (RM)
Fontinalis neomexicana Sull. & Lesq. (RM)

FUNARIACEAE

- Fumaria flavicans* Michx. (Porter 1935)
Fumaria hygrometrica Hedw. (RM)
Physcomitrium hookeri Hampe (TENN)

GRIMMIACEAE

- Coscinodon calyptratus* (Hook. in Drumm.) C. Jens ex Kindb. (RM)
Grimmia affinis Hoppe & Hornsch. ex Hornsch (RM)
Grimmia anodon Bruch & Schimp. in BSG (NY, RM)
Grimmia anomala Hampe ex Schimp. (Lawton 1971)
Grimmia domiana Sm. (Wynne 1943)
Grimmia elatior Bruch ex Bals. & De Not. (RM)
Grimmia laevigata (Brid.) Brid. (Porter 1935)
Grimmia montana Bruch & Schimp. in BSG (RM)
Grimmia ovalis (Hedw.) Lindb. (RM)
Grimmia plagiopodia Hedw. (RM)
Grimmia pulvinata (Hedw.) Sm. (RM)
Grimmia tenerrima Ren. & Card. (RM)
Grimmia torquata Hornsch. in Grev. (CSU)
Grimmia trichophylla Grev. (Lawton 1971, Spence 1985)
Jaffuelobryum wrightii (Sull. in Gray) Ther. (Wynne 1943)
Racomitrium canescens (Hedw.) Brid. (COLO, RM, WTU)
Racomitrium lanuginosum (Hedw.) Brid. (Crum and Anderson 1951)
Racomitrium sulcatum (Finck) Bruch & Schimp. in BSG (COLO, WTU)
Schistidium agassizii Sull. & Lesq. in Sull. (RM)
Schistidium apocarpum (Hedw.) Bruch & Schimp. in BSG (NY, RM)
Schistidium occidentale (Lawt.) Churchill (Lawton 1971) (RM)
Schistidium rivulare (Brid.) Podp. var. *rivulare* (RM)
 var. *latifolium* (Zett.) Crum & Anderson (BUF)
Schistidium tenerum (Zett.) Nyh. (RM)
Scutellaria aquatica Hook. in Drumm. (RM)

HEDWIGIACEAE

- Hedwigia ciliata* (Hedw.) P. Beauv. (BUF, RM)

HELODIACEAE

- Helodium blandoucii* (Web. & Mohr) Warnst. (BUF, RM)

HYLOCOMIACEAE

- Hylocomium splendens* (Hedw.) Schimp. in BSG (RM)
Pleurozium schreberi (Brid.) Mitt. (WTU)
Rhytidiadelphus triquetrus (Hedw.) Warnst. (RM)

HYPNACEAE

- Hypnum cupressiforme* Hedw. var. *cupressiforme* (BUF, NY, RM)

- var. *resupinatum* (Tayl.) Schimp. in Spruce (Porter 1935)

- Hypnum lindbergii* Mitt. (RM)
Hypnum pallescens (Hedw.) P. Beauv. (RM)
Hypnum revolutum (Mitt.) Lindb. (RM)
Hypnum vaucheri Lesq. (LAF)
Isopterygiopsis pulchella (Hedw.) Iwats. (RM)
Platydictya jungermannioides (Brid.) Crum (RM)
Ptilium crista-castrensis (Hedw.) De Not. (WTU)
Pylaisiella polyantha (Hedw.) Grout (Porter 1935)

LESKEACEAE

- Pseudoleskea incurvata* (Hedw.) Loeske (CSU, RM)
Pseudoleskea patens (Lindb.) Kindb. (RM)
Pseudoleskea radicata (Mitt.) Macoun & Kindb. (RM)
 var. *compacta* Best (Lawton 1971)
 var. *pallida* (Best) Crum, Steere & Anderson (Lawton 1971)
Pseudoleskea stenophylla Ren. & Card. in Roell. (Spence 1985)
Pseudoleskeella tectorum (Funck ex Brid.) Kindb. in Broth. (NY, RM, WTU)

MEESIAEAE

- Amblyodon dealbatus* (Hedw.) Bruch & Schimp. in BSG (WTU)
Meesia uliginosa Hedw. (RM)

MNIACEAE

- Cinclidium stygium* Sw. in Schrad. (BUF, NYS)
Mnium ambiguum H. Muell. (RM)
Mnium arizonicum Amann (CSU, RM)
Mnium blyttii Bruch & Schimp. in BSG (RM)
Mnium marginatum (With.) Brid. ex P. Beauv. (RM)
Mnium spinulosum Bruch & Schimp. in BSG (Porter 1935, Spence 1985)
Mnium thomsonii Schimp. (RM)
Plagiomnium ciliare (C. Muell.) T. Kop. (RM)
Plagiomnium cuspidatum (Hedw.) T. Kop. (RM)
Plagiomnium drummondii (Bruch & Schimp.) T. Kop. (RM)
Plagiomnium ellipticum (Brid.) T. Kop. (RM)
Plagiomnium medium (Bruch & Schimp. in B. S. G.) T. Kop. (BUF, RM)
Plagiomnium rostratum (Schrad.) T. Kop. (WTU)
Rhizomnium magnifolium (Horik.) T. Kop. (RM)
Rhizomnium pseudopunctatum (Bruch & Schimp.) T. Kop. (RM)
Rhizomnium punctatum (Hedw.) T. Kop. (Porter 1935, Spence 1985)

NECKERACEAE

- Neckera pennata* Hedw. (RM)

ORTHOTRICHACEAE

- Amphidium lapponicum* (Hedw.) Schimp. (CSU)
Orthotrichum affine Brid. (Porter 1935)
Orthotrichum alpestre Hornsch. in BSG (RM)
Orthotrichum anomalum Hedw. (NY)
Orthotrichum cupulatum Brid. (NY, RM)
Orthotrichum hallii Sull. & Lesq. in Sull. (BUF, RM)
Orthotrichum holzingeri Ren. & Card. in Holz. (RM)
Orthotrichum laevigatum Zett. (COLO, RM)

- Orthotrichum obtusifolium* Brid. (MO)
Orthotrichum pellucidum Lindb. (BUF, NY, RM)
Orthotrichum praemorsum Vent. in Roell (Porter 1935, Vitt 1973)
Orthotrichum pylaisii Brid. (Vitt 1973)
Orthotrichum rivulare Turn. (Lawton 1971)
Orthotrichum rupestre Schleich. ex Schwaegr. (RM)

PLAGIOTHECIACEAE

- Plagiothecium denticulatum* (Hedw.) Schimp. in BSG (WTU)
Plagiothecium piliferum (Sw. ex Hartm.) Schimp. in BSG (Spence 1985)

POLYTRICHACEAE

- Atrichum schuykii* Aust. (RM, US)
Atrichum undulatum (Hedw.) P. Beauv. (Spence 1985)
Polytrichastrum alpinum (Hedw.) G. L. Sm. var. *alpinum* (COLO, RM)
Polytrichum commune Hedw. (RM)
Polytrichum formosum Hedw. (Ireland 1982)
Polytrichum juniperinum Hedw. (RM)
Polytrichum longisetum Brid. (RM)
Polytrichum lyallii (Mitt.) Kindb. (BUF, RM)
Polytrichum piliferum Hedw. (RM)
Polytrichum sexangulare Brid. (RM)
Polytrichum strictum Brid. (RM)

POTTIACEAE

- Barbula convoluta* Hedw. var. *convoluta* (RM)
Barbula unguiculata Hedw. (BUF, LAF)
Bryocryptophyllum recurvirostre (Hedw.) Chen (BUF, RM, WTU)
Desmatodon cernuus (Hueb.) Bruch & Schimp. in BSG (RM, WTU)
Desmatodon guypinii Bruch & Schimp. in BSG (BUF, RM)
Desmatodon heimii (Hedw.) Mitt. (BUF, RM)
Desmatodon latifolius (Hedw.) Brid. (TENN, RM, WTU)
Desmatodon leucostoma (R.Br.) Berggr. (WTU)
Desmatodon obtusifolius (Schwaegr.) Schimp. (BUF, RM)
Desmatodon plinthobius (Sull. & Lesq. in Sull. (Medina 1994)
Desmatodon porteri James in Aust. (Porter 1937)
Desmatodon systylius Schimp. (BUF, RM)
Didymodon asperifolius (Mitt.) Crum, Steere & Anderson (COLO, RM)
Didymodon fallax (Hedw.) Zand. var. *fallax* (RM)
 var. *reflexus* (Brid.) Zand. (Crum and Anderson 1981)
Didymodon rigidulus Hedw. var. *rigidulus* (BUF)
 var. *gracilis* (Schleich. ex Hook. & Grev.) Zand. (BUF, NY, RM)
 var. *icmadophilus* (Schimp. ex C. Muell.) Zand. (BUF)
Didymodon vinealis (Brid.) Zander var. *vinealis* (BUF, RM)
 var. *flaccidus* (Bruch & Schimp. in Schimp.) Zand. (BUF)
 var. *hurdus* (Hornsch. in Spreng.) Zand. (as *Didymodon trifarius* (Wynne 1943)
 var. *nicholsonii* (Culm.) Zand. (RM)
 var. *rubiginosus* (Mitt.) Zand. (BUF)
Gymnostomum aeruginosum Sm. (BUF, RM, WTU)
Hymenostylium recurvirostre (Hedw.) Dix. (RM, WTU)
Paludella squarrosa (Hedw.) Brid. (Lawton 1971)
Pterygoneurum ovatum (Hedw.) Dix. (BUF, NY, RM)
Pterygoneurum subsessile (Brid.) Jur. (BUF, NY, RM)

- Stegonia latifolia* (Schwaegr. in Schultes) Vent. ex Broth. (Lawton 1971)
Tortella fragilis (Hook. & Wils. in Drumm.) Limpr. (BUF, LAF, NY, RM, WTU)
Tortella humilis (Hedw.) Jenn. (Spence 1985)
Tortella tortelloides (S. Greene) Robins. (BUF, WTU)
Tortella tortuosa (Hedw.) Limpr. (BUF, RM)
Tortula caninervis (Mitt.) Broth. (BUF, NY, RM)
Tortula incermis (Brid.) Mont. (Porter 1935)
Tortula mucronifolia Schwaegr. (BUF, NY, RM)
Tortula norvegica (Web.) Wahlenb. ex Lindb. (BUF, RM)
Tortula papillosissima (Copp.) Broth. (BUF, RM)
Tortula ruralis (Hedw.) Gaertn., Meyer & Scherb. (BUF, RM)
Trichostomopsis australasiac (Grev. & Hook.) Robins. (BING, BUF)

PTERYGYANDRACEAE

- Heterocladium dimorphum* (Brid.) Schimp. in BSG (BUF)
Miurella julacca (Schwaegr.) Schimp. in BSG (RM)

RHYTIDIACEAE

- Rhytidium rugosum* (Hedw.) Kindb. (WTU)

SELIGERACEAE

- Blindia acuta* (Hedw.) Bruch & Schimp. in BSG (COLO, CSU, RM)
Seligeria campylopoda Kindb. in Macoun & Kindb. (ALTA, BUF, RM)

SPHAGNACEAE

- Sphagnum angustifolium* (C. Jens. ex Russ.) C. Jens. in Toff (COLO, RM)
Sphagnum annulatum H. Lindb. ex Warnst. (BING, RM)
Sphagnum contortum Schultz (BING)
Sphagnum fimbriatum Wils. in Wils. & Hook. f. (COLO, RM)
Sphagnum fuscum (Schimp.) Klinggr. (RM)
Sphagnum platyphyllum (Lindb. ex Braithw.) Sull. ex Warnst. (RM)
Sphagnum russowii Warnst. (RM)
Sphagnum squarrosum Crome (RM)
Sphagnum subsecundum Nees in Sturm (BING)
Sphagnum teres (Schimp.) Aongstr. in Hartm. (BING)
Sphagnum warnstorffii Russ. (RM, COLO)

SPLACHNACEAE

- Splachnum sphaericum* Hedw. (YELLOW)
Tayloria acuminata Hornsch. (Crum and Anderson 1981)
Tayloria ligulata (Dicks.) Lindb. (COLO, RM)
Tayloria serrata (Hedw.) Bruch & Schimp. in BSG (NY)

TETRAPHIDACEAE

- Tetraphis pellucida* Hedw. (RM)

THUIDIACEAE

- Abietinella abietina* (Hedw.) Fleisch. (BUF, RM)

TIMMIACEAE

- Timmia austriaca* Hedw. (BUF, RM)

Timmia megapolitana Hedw. var. *megapolitana* (NY, RM)
var. *bavarica* (Hessl.) Brid. (BUF, RM)

PROBLEMATIC TAXA

Brachythecium campestre (C. Muell.) Schimp. in BSG. Old Faithful, Yellowstone National Park, Smiley, according to Porter (1934, 1935). Porter's citation is apparently not based on a specimen but on Dwight Smiley's checklist. Since this is primarily a taxon of the eastern United States, it should probably be excluded from the state flora. Specimen not seen.

Brachythecium oxycladon (Brid.) Jaeg. This taxon, typical of the eastern United States, is based by Porter (1934, 1935) on a citation by Smiley. No corresponding specimens were seen.

Funaria flavicans Michx. No specimens were seen of this taxon reported by Porter (1935). As it appears to be a species of the eastern region of the United States (Crum and Anderson 1981), it is of doubtful occurrence in Wyoming.

Mnium hornum Hedw. (Porter 1935). This is a taxon of the eastern montane region of North America and the Piedmont (Crum and Anderson 1981) and not likely to occur in Wyoming. No specimen seen.

Platydictya confervoides (Brid.) Crum. Cited by Porter (1935) as a doubtful determination; it cannot be located in the herbaria consulted.

Racomitrium fasciculare (Hedw.) Brid. Porter (1935) did not see a specimen of this species, reported by Nelson (1900). Spence's citation for Teton County (1985) refers to Porter's doubtful citation. No specimens were seen by the present author.

EXCLUDED TAXA

Brachythecium calcareum Kindb. A specimen of Smiley's of *Brachythecium flexicaule*, now *B. calcareum*, from Yellowstone National Park and cited by Porter (1935) was determined as a depauperate specimen of *B. frigidum*.

Brachythecium glaucosum (Br.) B. & S. Lake, Yellowstone National Park (Smiley) (Porter 1934, 1935). Specimens of Smiley and other collectors at YELLO were variously *Brachythecium salebrosus*, *B. leibergii*, *B. albicans*, and *B. frigidum*.

Breutelia mohriana (C. Muell.) Broth., Carbon Co. (Porter 1937). Excluded from North America (Anderson et al. 1990).

Brotherella recurvans (Michx.) Fleisch., Lincoln Gulch, Albany County (Aven Nelson 2628). "The material is scanty, and Prof. Holzinger, who identified it, expressed a doubt as to the correctness of the determination" (Porter 1935). The specimen with Holzinger's opinion is at RM.

Bryum canariense Brid. (Porter 1935). This is a species of the West Coast and not likely to occur in Wyoming. The specimen cited by Porter (Nelson 7814) curated at RM and US seems to be *Bryum caespiticium* Hedw.

Encalypta streptocarpa Hedw. (Porter 1930, 1935). Excluded from North America (Anderson et al. 1990).

Gymnostomum calcareum Nees & Hornsch. in Nees et al. (Porter 1937. "Washakie Co."). The specimen from WTU of Porter, Sept. 9, 1935, No. 2094, "On limestone boulders in a shady canyon" from the Ten Sleep Canyon in the Big Horn Mts, Washakie, Co., has been determined to be *Gymnostomum aeruginosum* by R. Zander. The specimen in section shows a ventral costal epidermis, two stereid bands, a central strand in the stem. The capsules were young and so rather ovoid.

Homalothecium lutescens (Hedw.) Robins. Based on a citation by Porter (1937) and probably the specimen: Yellowstone National Park Nelson No. 6041 (RM) appears to me to be *Homalothecium aeneum* instead.

Hypnum callichroum Funck. ex Brid., Evanston, Uinta County (Aven Nelson 4128, in part: "The identity of this plant is doubtful," Porter 1935; Uinta Co., Porter 1937). The specimen Nelson 4128 appears to be *Hypnum lindbergii*.

Macrocoma sullivanii (C. Muell.) Grout (BUF). This record is due to a labeling error (Vitt 1981; D. Vitt, *in litt.*), in the Orthotrichaceae Boreali—Americanae Exsiccatae Fasciculus III Nos. 21–30. The label issued with this species name, number 30, should be number 27, *Orthotrichum rupestre*. The *Macrocoma* specimen originated in North Carolina, the *Orthotrichum* from Yellowstone National Park (J. A. Christie, *in litt.*).

Moesia triquetra (Richt.) Aongstr. reported by Cooper and Andrus (1994) is *Oncophorus wahlenbergii*.

Orthotrichum speciosum Nees in Sturm (Porter 1935). Specimens at YELLO and RM were determinable as *O. lacvigatum*.

Orthotrichum pallens Bruch ex Brid. var. *parvum* Vent., "Yellowstone National Park"

(Flowers 1973). Excluded from North America (Anderson et al. 1990).

Physcomitrium pyriforme (Hedw.) Hampe, cited by Porter (1937) for Crook Co., is probably a specimen collected by Marion Ownbey from that county (No. 556a, TENN) and determined by Porter as *P. turbinatum*, but which, upon examination, is *P. hookeri*.

Plagiommium affine (Bland. ex Fimck) T. Kop. (Porter 1935). Excluded from North America (Anderson et al. 1990).

Plagiothecium cavifolium (Brid.) Iwats. Porter (1935) based this name on a specimen of Elias Nelson (5242), which is *Isopterygiopsis pulchella*.

Sphagnum capillifolium (Ehrh.) Hedw. (Porter 1935). Porter's specimens 1198 and 1199 collected in 1932 identified as *S. capillifolium* had been redetermined by R. Andrus as *S. russowii* (Andrus *in litt.*).

Sphagnum majus (Russ.) C. Jens. (Porter 1935, Crum 1984). Taxa collected from Wyoming and identified as *S. majus* have all been *S. annulatum*, according to Andrus (*in litt.*), who states that the nearest sites would be in British Columbia, central Alberta, and Minnesota.

Sphagnum palustre L. (COLO, RM). This species has been found only along the West Coast by Andrus (*in litt.*).

Sphagnum recurvum P. Beauv. (COLO, RM). Material of this species from the interior of the United States is referable to *S. angustifolium*, according to Andrus (*in litt.*). *Sphagnum recurvum* is an eastern coastal plain species.

Tortula princeps De Not. Reports by Porter from Carbon and Crook counties (1935) were based on Nelson 2818 and 5034 at RM, and a specimen (RM) by Hermann (No. 17844), which were redetermined by R. Zander as *Tortula ruralis*.

Weissia controversa Hedw. (Porter 1935). All citations for this species appear to be based on specimens of Dwight C. Smiley, deposited at YELLO. All 3 specimens seen were *Dicranoweisia crispula*.

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LITERATURE CITED

- ANDERSON, L. E. 1990. A checklist of *Sphagnum* in North America north of Mexico. *Bryologist* 93: 500-501.
- ANDERSON, L. E., H. A. CRUM, AND W. R. BUCK. 1990. List of the mosses of North America north of Mexico. *Bryologist* 93: 448-499.
- BRASSARD, GUY R. 1983. Checklist of the mosses of the island of Newfoundland, Canada. *Bryologist* 86: 54-63.
- CHRISTY, J. A., J. H. LYFORD, AND D. H. WAGNER. 1982. Checklist of Oregon mosses. *Bryologist* 85: 22-36.
- CHURCHILL, S. P. 1979. Mosses of the Great Plains III. Additions to Nebraska and the Black Hills of South Dakota and Wyoming. *Bryologist* 82: 72-75.
- _____. 1982. Mosses of the Great Plains VIII. Additions. *Bryologist* 85: 218-221.
- COOPER, DAVID J., AND RICHARD E. ANDRUS. 1994. Patterns of vegetation and water chemistry in peatlands of the west-central Wind River Range, Wyoming. *U.S.A. Canadian Journal of Botany* 72: 1586-1597.
- CRUM, H. A. 1984. Sphagnopsida, Sphagnaceae. North American flora, series II; part 11. *New York Botanical Garden*. 180 pp.
- CRUM, H. A., AND L. E. ANDERSON. 1981. Mosses of eastern North America. Columbia University Press, NY.
- EVERSMAN, S., AND A. J. SHARP. 1980. First checklist of Montana mosses. *Proceedings of the Montana Academy of Science* 39: 12-24.
- FLOWERS, S. A. HOLMGREN, EDITOR. 1973. Mosses, Utah and the West. Brigham Young University Press, Provo, UT.
- HORTON, D. G. 1983. A revision of the Encalyptaceae. II. *Journal of the Hattori Botanical Laboratory* 54: 353-532.
- IRELAND, R. R. 1982. Moss flora of the Maritime Provinces. National Museums of Canada, Ottawa.
- JOHNSON, ARDITH B. [Undated]. Keys to the mosses of Arizona. Research Paper 14. Museum of Northern Arizona, Flagstaff.
- KETCHLEDGE, E. H. 1980. Revised checklist of the mosses of New York State. In: R. S. Mitchell, editor, *Flora of New York State*. New York State Museum Bulletin 440. Albany, NY.
- LAVIN, M. 1981. New records for the moss flora of Nevada. *Bryologist* 84: 93-94.
- LAWTON, E. 1958. Mosses of Nevada. *Bryologist* 61: 314-334.

- _____. 1971. Moss flora of the Pacific Northwest. Journal of the Hattori Botanical Laboratory, Nichinan, Japan.
- MCCLEARY, J. A., AND V. V. GREEN. 1971. A checklist of Idaho mosses. *Bryologist* 74: 175–180.
- MEDINA, ALVIN L. 1994. Lichens and bryophytes of the Rochelle Hills, Campbell County, Wyoming. *Evansia* 1: 121–130.
- NELSON, AVEN. 1900. The cryptogams of Wyoming. 10th annual report of the Wyoming Experiment Station, Laramie. 38 pp.
- PORTER, C. L. 1930. Fruiting plants of *Eucalypta contorta*. *Bryologist* 34: 93.
- _____. 1934. The moss genus *Brachythecium* in Wyoming. University of Wyoming Publications in Science. Botany 1(9): 235–241.
- _____. 1935. Bryophytes of Wyoming. Part II. Hepaticae (concluded) and Musci. *Bryologist* 38: 101–114.
- _____. 1937. The bryophytes of Wyoming. Unpublished doctoral dissertation, University of Washington, Seattle.
- SAYRE, G. 1971. Cryptogamae exsiccatae, an annotated bibliography of published exsiccatae of Algae, Lichenes, Hepaticae, and Musci. *Memoirs of the New York Botanical Garden* 19(2): 175–176; 214–215.
- SHAW, A. J. 1981. A taxonomic revision of the propagiferous species of *Pohlia* (Musci) in North America. *Journal of the Hattori Botanical Laboratory* 50: 1–81.
- SPENCE, J. R. 1985. Checklist of the mosses of Grand Teton National Park and Teton County, Wyoming. *Great Basin Naturalist* 45: 124–126.
- _____. 1988. Checklist of the mosses of the Intermountain West, USA. *Great Basin Naturalist* 48: 394–401.
- VITT, D. H. 1973. A revision of the genus *Orthotrichum*. *Bryophytorum Bibliotheca*, J. Cramer Verlag, Vaduz.
- _____. EDITOR. 1981. *Orthotrichaceae Boreali—Americanae exsiccatae fasciculus III*, Nos. 21–30. University of Alberta, Edmonton, Canada.
- _____. 1991. Rediscovery of *Orthotrichum holzingeri*: its morphology and habitat in western North America. *Bryologist* 94: 77–79.
- WEBER, W. 1973. Guide to the mosses of Colorado. Institute of Arctic and Alpine Research Occasional Paper 6, University of Colorado, Denver.
- WYNNE, F. E. 1943. Range extensions of mosses in western North America. *Bryologist* 46: 149–155.

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